CURRENT EFFORTS TO RESETTLE THE AFGHAN REFUGEES

The United Nations, in an effort coordinated by Sadruddin Aga Khan, is attempting to raise 2 billion dollars to be spent in an international effort to resettle the estimated 5.5 million Afghan refugees. The effort is to take place in two phases: an immediate relief/rehabilitation phase, followed by a long-term recovery phase. Several nations have pledged funds in support of the effort. The U.S. pledged $119 million to be spent in 1988. In addition to these funds, the Reagan administration announced in June, 1988 that the U.S. would donate $16 million in surplus farm commodities to the Afghan refugees. Most of the $16 million was in the form of surplus wheat, sugar, and dried milk. In addition to these funds the Senate Appropriations subcommittee on foreign operations earmarked, in June, 1988, an additional $50 million to help Afghan refugees during fiscal 1989.

The U.N. High Commission on Refugees will provide refugees with the means (food stocks, implements, etc.) to reestablish themselves in Afghanistan. The World Food Program has developed an estimate of requirements for 18 months of food needed during the resettlement process. Their estimate of the food needs are based on the daily ration given to Afghan refugees in Pakistan, namely, 500 grams of wheat, 30 grams of oil, 20 grams of sugar, and 3 grams of tea. The estimated cost of providing this food aid is US $335million. Proposed agricultural commodity inputs to be provided directly to the farmers in Afghanistan include seeds, fertilizers, farm tools, draught animals, small tractors, animal feed and animal vaccines against rinderpest and foot-and-mouth disease. Some 50,000 tons of wheat seed, 5,000 tons of cotton seed and 1,000 tons of vegetable seed to cover two planting seasons will be provided along with 50,000 tons of urea and 100,000 tons of phosphates.

The U.N. Development Project (UNDP) will begin the process of assisting the Afghan government with its economic recovery program. To get this effort started, the UNDP will fund priority projects such as technical surveys for capital assistance, sectoral plans for recovery and rehabilitation, and comprehensive assessments of needs in the early stages of the rehabilitation effort.

ESTIMATING AFGHANISTAN'S WHEAT-RELATED NEEDS

Given the seriousness of the task of resettling the Afghan refugees and Afghanistan itself, it may be helpful to use the small amount of existing information to develop various estimates of Afghanistan's wheat-related needs in order to better understand the magnitude of the effort that will be required. Some simple mathematics can identfy some of the parameters of the problem and help place the proposed level of assistance in perspective.

Food Wheat Needs

To feed the 17,337 thousand people reported to live in Afghanistan in 1986 would require, based on the 500 gram per person daily requirement, approximately 3.2 million metric tons of wheat per year. The United States Department of Agriculture World Agricultural Outlook Board (USDA) estimates that total, annual wheat utilization in Afghanistan has averaged 3.1 million mt over the period

1979/80 - 1987/88. Note that if the 2,345 thousand hectares planted to wheat produced the high rate of yield obtained on irrigated land in 1978 (2.4 mt/ha), annual production would be 5.6 million metric tons. These figures imply that Afghanistan, with a population of 17.3 million people, would be self-sufficient in wheat if average yields remain above 1.3 mt/ha.

The annual food wheat needs of the 5.5 million refugees can be estimated to be 1.0 million metric tons. Thus, under the assumption that the total population of Afghanistan would be 22.8 million after the return of the refugees, the annual food wheat needs for the nation will be approximately 4.2 million mt and will require a 1.8 mt/ha average yield for self-sufficiency. The goal of self-sufficiency could be achieved by producing irrigated wheat at the 1978 rate of 2.4 mt/ha on 1.1 million hectares and dryland wheat at the 1978 dryland rate of 1.1 mt/ha on 1.4 million hectares. No expansion would be required in the area estimated to be devoted to dryland wheat to achieve this goal; however, the amount of irrigated land devoted to wheat production would have to expand approximately 20 percent over the area estimated to be devoted to irrigated wheat in 1978 (900,000 hectares).

USDA statistics indicate that Afghanistan has been importing 350,000 mt of wheat annually since 1981/82. To produce this additional amount of wheat domestically, on irrigated land, would require the production from approximately 146,000 hectares which would require a 16 percent increase in the irrigated area typically devoted to wheat (estimated at 900,000 hectares). To produce, on irrigated land, the 350,000 mt needed to fillout comsumption needs prior to the return of the refugees and the 1.0 million mt required annually by the refugees would require a 60 percent expansion in irrigated land devoted to wheat cultivation (using the 2.4 mt yield figure for calculation).

Wheat Seed and Fertilizer Needs

Using the data given in Tables 2 and 6 along with some assumptions regarding seeding rates, estimates can be made of the seed and fertilizer requirements to plant the size wheat crop planted in 1978. An average wheat seeding rate in the U.S. is approximately 75 kg per hectare. Seeding rates in an area such as Afghanistan, where traditional tillage and sowing techniques are practiced, can be double the U.S. rate. To plant the 2,345 thousand hectares planted in 1978, using seeding rate assumptions of 75 to 150 kg per hectare, would require 176,000 to 352,000 metric tons of seed.

Fertilizer requirements, at the rate of 193 kg per hectare reported used by Afghan farmers for white fertilizer alone would be 453,000 metric tons. These estimates can be refined by using information from the ASA suggesting that 77 percent of the wheat crop is grown on irrigated land. This information and a irrigated land yield rate of 2.4 mt per hectare can be used to estimate the areas of wheat grown under irrigated and dryland conditions (900,000 and 1,400,000 hectares respectively). Combining these estimates with recommended nitrogen and phosphate application rates for irrigated and dryland wheat (120-60-0 and 60-60-0, N-P-K, respectively), the total white and grey fertilizer requirements for the nation can be estimated at 306;000 and 299,000 metric tons respecitively. (These estimates assume the nutrient level of nitrogen in white fertilizer (urea) is 45 per cent and the nutrient levels of nitrogen and

phosphate in grey fertilizer (diammonium phosphate) are 18 and 46 percent, respectively.)

Under the assumption that seed and fertilizer needs for the Afghans who remained in Afghanistan can be supplied from existing sources, an estimate of the seed and fertilizer needs for the returning refugee population only may be useful. Using the daily wheat needs assumption of 500 grams per day and the assumption that the returning population would total 5.5 million people, the yearly food wheat needs for the refugees can be estimated at approximately 1 million metric tons. To grow this amount of wheat on nonirrigated land would require approximately 912,000 hectares at the yield rate on nonirrigated land of 1.1 mt per hectare. Yearly seed requirements, at the rates used above, would be 68,000 to 137,000 metric tons. Yearly fertilizer requirements would be 119,000 metric tons of diammonium phosphate and 74,000 metric tons of urea.

The estimates of seed and fertilizer needs developed here should be compared with the amounts proposed to be provided to the Afghanistan refugees under the U.N. resettlement program. Under that program, FAO announced it would provide 50,000 mt of wheat seed, 50,000 mt of urea and 100,000 tons of phosphates. It was unclear from the available documents (Appeal of the Secretary-General, Annex III) whether these supplies were intended to be sufficient for one or two crops.

Providing the seed, from Afghan sources, to produce the required levels of wheat could require up to three years, depending on the quantity of existing seed that is well adapted to the various regions of the country. The ASA estimated that the use of improved wheat seed has declined since 1978 due to lack of supplies. To introduce unproven seed varieties would expose the already stressed farmers to additional risk. Thus, it may be advisable for farmers to plant locally available seed (saved from previous crops) where possible. In the meanwhile, the process of screening, selecting, and multiplying improved seed for use in the various different micro-climates in the country will require two to three growing seasons. In the first season, varieties are selected from variety screening trials. During the second season the selected varieties are released to selected farmers for on-farm trials. In the third season, the seed are distributed to seed growers for multiplication. The process could be shortened by the existence of knowledge of and quantities of desirable seed.

Farm Power Needs

Rebuilding the farm power resources of Afghanistan may be one of the more critical constraints to rebuilding the agricultural sector. The ASA estimated that the number of draught oxen owned by farm families has declined by 40 percent since 1978. ASA figures indicate that the national average number of oxen owned by farm families in 1978 was 1.52. Using the 1.2 million figure given by the ASA as the number of farm families existing in 1978, the number of oxen can be estimated between 1.8 and 2.4 million in 1978. To rebuild this herd from its present number (60 percent of the 1978 figure) would require the addition of 730,000 to 960,000 oxen. Developing this number of oxen from domestic Afghan stock will require several years. Two factors are involved. First, the prefered sex for use as oxen is the male, since using the females reduces their reproductive capability. Second, although oxen can remain productive for several

years (the Pakistan referred to below study suggests 10 to 15 years), they are not put to work until age three.

Lacking specific information on animal traction in Afghanistan, information from a recent study of animal traction in Pakistan may be useful in understanding Afghan needs under the assumption that the small farm technologies of the two countries are reasonably similar. Small farmers in Pakistan, with average farm holdings of 4.8 hectares, depend quite heavily on their oxen. The oxen are used in rice and wheat culture to perform ploughing, leveling, planting, interculturing, partial threshing, transportation by cart and on back, fodder chopping and sugar cane crushing. Typical animal-drawn implements owned by Pakistani farmers include plough, land plane, leveller, hoe roller, drill, hoe, cultivator, thresher, fodder cutter, digger, Persian wheel, cart, and cane crusher. The broad range of tasks performed with animal power implies that the transition to mechanical power will be costly since a tractor with a couple of implements will not fully replace the oxen for most farmers.

CONCLUSION

Information to base plans for the reconstruction of Afghan agriculture is very limited; however, the available information can be used to develop ranges of values for critical input needs. This process has provided some idea of the magnitude of the problem and has highlighted a possible, critical constraint in farm power resources. The need for better information and more concise planning efforts is evident.

REFERENCES

Ahmad, S. 1983. Animal Power in Pakistan Agriculture: A Review. Islamabad: Pakistan Agricultural Research Council.

Food and Agriculture Organization of the United Nations. 1986. 1985 FAO Fertilizer Yearbook, vol. 35. Rome: FAO.

Food and Agriculture Organization of the United Nations. 1987. 1986 FAO Production Yearbook, vol. 40. Rome: FAO.

Gul, Azam et al. 1988. The Agricultural Survey of Afghanistan. The Swedish Committee for Afghanistan, Peshawar, Pakistan.

Hason, H., N. Borlang, and R. Anderson. 1982. Wheat in the Third World. Boulder, CO., Westview Press.

Nyrop, R. and D. Seekins. 1986. Afghanistan, A Country Study. Washington, D. C.: The American University.

Personal Communication from Andrew C. Aaronson. September 2, 1988. World Agriculture Outlook Board, United States Department of Agriculture.

United Nations. 1988. Conference on United Nations Humanitarian and Economic Assistance Programmes Relating to Afghanistan, New York, 14 June 1988, Appeal of the Secretary-General. New York: United Nations.

AGRICULTURE IN AFGHANISTAN: A BACKGROUND PAPER FOCUSING ON WHEAT

BY J.D. LEA

INTRODUCTION

The withdrawal of U.S.S.R. troops, who have been stationed in Afghanistan since 1979, signals the eventual return of more open economic and political relations between Afghanistan and the rest of the world. It also suggests a more expanded U.S. role in Afghanistan affairs and therefore revitalizes U.S. interest in Afghan agriculture. This report provides a survey of current knowledge about Afghan agriculture and current estimates of the material requirements to resettle the Afghan people displaced during the period of hostilities.

AGRICULTURE IN AFGHANISTAN PRIOR TO 1978

Agriculture has traditionally been the foundation of the Afghan economy not only because of its large contribution to gross domestic product (GDP) and national employment but also because it provided many of the materials upon which much of the country's industry and trade depended. The share of agricultural output in GDP, not counting the major portion of agricultural output consumed on farms, remained about 60 percent between 1961 and 1980. Agriculture employed the majority of the labor force, although its share was decreasing from 64 percent in 1977 to 56 percent in 1982 due to increased employment in the energy sector. Agriculture in 1978, was the major occupation for some 1.2 million farm families. Table 1 presents some descriptive statistics of the Democratic Republic of Afghanistan along with similar data on its neighbors.

TABLE 1

Population and Land Area Statistics

	Afghanistan			Pakistan			Iran		
Year	Pop K[a]	Total Land K HA[b]	Arable Land K HA	Pop K	Total Land K HA	Arable Land K HA	Pop K	Total Land K HA	Arable Land K HA
1970	13623	64750	7870	65706	77088	19167	28397	163600	15150
1975	15378		7910	74734		19595	33344		15850
1980	16063		7910	86143		19994	38635		12981
1985	16519		7910	100380		20100	44632		14100
1986	17337			102645			45885		

[a] K = thousands
[b] K HA = thousand hectares

Source: Food and Agriculture Organization of the United Nations. FAO Production Yearbooks for various years.

Prior to 1978, cotton was the critical raw material for the textile industries and a valuable export; wool was the main input for the important carpet industry and was also an important export commodity. Cottonseed was the key input for

the extraction, refining, and soap industries. The sugar beet crop was refined domestically, and there was also fruit and nut processing and packaging for export. Hides and skins, such as karakul (from karakul sheep), were key inputs for much of the local handicrafts industry and were also major export items. Agricultural exports in 1978 were valued at US$222 million and included: cotton, 34,000 mt worth US$55 million; fruit, US$106 million; hides and skins and other products worth US$61 million. Agricultural products constituted 75 percent of the country's exports in 1977, but this percentage fell to 43 percent in 1984 as natural gas exports increased.

Wheat, cultivated throughout Afghanistan, occupied half of the irrigated land and most of the rain-fed crop land before 1978 and was the basic staple of the Afghan diet. After the drought of 1971-72 and the subsequent famine in parts of the country, self-sufficiency in food, especially wheat, became a major goal of the government. Production of cereals rose just enough during the 1970s to obviate the need for imports during years when the precipitation was normal. During dry years, however, such as 1977, the country had to import wheat and other staples. With the disruption of agriculture caused by hostilities after 1978, the government had to buy wheat from foreign suppliers to avoid scarcities. In 1982 Afghanistan imported over 200,000 tons of wheat from the Soviet Union, and estimates of imports in 1983 and 1984 rose to twice that figure. This level of importation amounts to approximately 5 to 10 percent of the nation's yearly needs which are estimated at 3.2 million metric tons (see page 10).

Land Use Patterns

Of the total surface area of 63 million hectares in Afghanistan, only about 8 million are arable, the remainder being high mountain land and arid wasteland. There are no major water bodies in the country. The arable land is scattered throughout the country, primarily in valleys along rivers and other water sources. Prior to 1978 the total irrigable area was about 5.2 million hectares, of which half was irrigated annually while the other half remained fallow. Only 1.4 million hectares of the land irrigated in sequence had sufficient water throughout the year to allow double cropping. Before 1978 the irrigated land area provided Afghanistan with 85 percent of all food and industrial crops. Another 1.4 million hectares of cultivated rain-fed land supplemented the irrigated areas. Thus, including the doubled cropped land, the total cropped landed should amount to 5.4 million hectares. However, the official statistics, as shown in Table 2, report about 4 million hectares of land were cultivated annually before 1978.

Irrigation

Due to a low and erratic level of rainfall, Afghan farmers have traditionally relied on irrigation. The water comes from melted snow from the mountains. A variety of methods have been developed to control and distribute the water supply. In the northern plains, where the land is relatively flat, diversion dams of brush, mud, and stone were built to divert the water into a series of irrigation canals and then onto the terraced plots of land in the narrow river valleys. Throughout the eastern, southern, and southwestern regions, farmers also used a system developed centuries ago by the Persians, called the karez. The karez is an underground tunnel connected by vertical shafts. These

traditional irrigation systems require a substantial amount of maintenance and are therefore vulnerable to disruption when labor supplies diminish for any reason such as war or economic reallocation.

TABLE 2

Area and Production of Crops in Afghanistan in 1978

Crop	Area	Production
	1000 hectares	1000 metric tons
Wheat	2,345	2,652
Maize	480	760
Barley	310	300
Rice	210	400
Other Cereals	43	35
Cotton	128	136
Sugarbeet	5	97
Sugarcane	4	64
Oilseeds	50	36
Vegetables	114	860
Fruits	210	1,122
Other Crops	77	413
Total	3,976	

Source: Afghan Agriculture in Figures, published by Central Statistics Office, Ministry of Planning, December, 1978. Reported in The Agricultural Survey of Afghanistan, First Report, May, 1988.

Much of government investment in agriculture, prior to 1978, had been in irrigation projects. The large investments did not realize higher crop yields immediately because of problems with land development and local farming techniques. There were also serious difficulties with soil salinity as a result of faulty drainage systems in areas brought under irrigation. With most of the investment funds going into irrigation projects, there was little emphasis on improving farming techniques or on training agriculturalists. Farmers generally used traditional farming techniques, implements, and seed. Little of the land was fertilized because animal manure was used for fuel and chemical fertilizers were either unavailable or uneconomical. Further aggravating the problem was the country's shortage of technical and agricultural specialists that limited the availability of extension services.

By the mid-1970s, Afghanistan's agricultural sector was making modest achievements. The weather was more favorable, and the use of fertilizers and pesticides was expanded. Fertilizer use increased from 9,000 tons in 1967 to over 100,000 tons in 1978. In the 1960s, the United States Agency for International Development (USAID) began a program designed to raise wheat output

through higher yielding varieties so that wheat output would rise enough to achieve basic self-sufficiency. New varieties of rice, sugarcane, sugar beets, and cotton were also introduced into the country. Average yields rose during the decade before 1978. Wheat production, for example, increased from 867 kilograms (KG) per hectare in 1966 to 1,131 KG in 1978. The higher wheat yields allowed farmers to grow larger amounts of cash crops such as cotton, sugar beets, and fruit. During the same period the government raised prices of cotton and sugar relative to wheat, and farmers produced more of these cash crops.

Crops

Table 3 provides official statistics on the major cereal crops in Afghanistan. Wheat has been the major crop in Afghanistan. In the years prior to the outbreak of fighting, wheat was double cropped on half of the irrigated land and single cropped in the spring on rain-fed land. The land area involved was about 2.4 million hectares. Production rose slowly before 1978, peaking at over 2.9 million tons in 1976. Wheat production per hectare in Afghanistan has usually been lower than the yields achieved in Pakistan but higher than those reported for Iran. See Table 4.

Corn, the second most important crop, was grown throughout the country over an area comprising about 500,000 hectares. It was consumed by both people and animals.

Barley cultivation took up 300,000 hectares in rain-fed highland areas. Production in the mid-1970s stayed near 400,000 tons annually.

Rice was grown primarily in the north around Baghlan and Konduz, as well as Herat and Nangarhar. In the mid-1970s around 200,000 hectares were devoted to rice production, and output was over 400,000 tones annually.

Cotton, the most important cash crop, competed with wheat for use of the irrigated land. The price of cotton was set by the government, and its profitability varied in relation to wheat. Farmers grew little cotton until its price was about twice that of wheat, afterwards cotton cultivation became widespread. However, cotton farmers typically continued to raise enough wheat to provide for their household consumption needs. Before 1978 cotton production increased steadily, from 71,000 tons grown on 55,000 hectares in 1968 to 165,000 tons grown on 112,000 hectares in 1976.

Sugar beets provided about two-thirds of domestically grown sugar with sugarcane providing the rest. In 1976, domestic supplies of sugar amounted to 15 percent of total consumption only. At that time Afghan sugar beet production was about 100,000 tons annually from 5,000 hectares. Sugarcane production was about 60,000 tons from 3,000 hectares farmed in the Jalabad region.

Afghanistan was well known regionally for its variety of fruits and vegetables. The country's grapes, raisins, and melons were famous export commodities, and grapes constituted 30 percent of the total fruit production. The country's fruit output in 1978 amounted to around one million meteric tons produced from about 210,000 hectares. Nut trees, including walnut, almond, and pistachio, were also

TABLE 3

Afghanistan Crop Statistics[a]

	Wheat			Corn			Barley			Coarse Grains			Rice			
Year	Area	Yield	Prod	Area	Yield	Prod	Area	Yield	Prod	Area	Yield	Prod	Area	Yield	Prod	Rough Milled Prod
60	2230	1.02	2279	500	1.40	700	350	1.08	378	850	1.27	1078	207	1.51	312	203
61	2230	1.02	2279	500	1.40	700	350	1.08	378	850	1.27	1078	210	1.52	318	207
62	2341	0.97	2279	500	1.40	700	350	1.08	378	850	1.27	1078	210	1.52	318	207
63	2341	0.83	1947	500	1.43	713	350	1.08	378	850	1.28	1091	210	1.52	318	207
64	2345	0.96	2250	505	1.43	720	350	1.09	380	855	1.29	1100	220	1.73	380	247
65	2347	0.97	2282	500	1.44	720	350	1.09	380	850	1.29	1100	220	1.73	380	247
66	2345	0.87	2033	505	1.43	720	350	1.07	375	855	1.28	1095	220	1.53	337	219
67	2352	0.97	2280	453	1.70	768	316	1.13	357	769	1.46	1125	205	1.93	395	257
68	2036	1.16	2354	453	1.71	773	317	1.14	361	770	1.47	1134	205	1.96	402	261
69	2070	1.19	2454	457	1.72	785	317	1.15	365	774	1.49	1150	206	1.98	408	265
70	2176	0.96	2081	451	1.48	667	315	1.17	370	766	1.35	1037	200	1.83	366	238
71	2350	0.81	1915	460	1.46	670	315	1.06	335	775	1.30	1005	200	1.75	351	228
72	2897	0.85	2450	460	1.48	680	320	1.09	350	780	1.32	1030	200	1.70	340	221
73	2236	1.23	2750	470	1.62	760	322	1.12	360	792	1.41	1120	210	2.00	420	273
74	2278	1.21	2750	476	1.62	770	340	1.12	380	816	1.41	1150	210	2.00	420	273
75	2350	1.19	2800	484	1.61	780	320	1.20	384	804	1.45	1164	210	2.15	451	293
76	2400	1.23	2940	490	1.61	790	390	1.03	400	880	1.35	1190	210	2.18	457	297
77	2450	1.18	2900	460	1.74	800	350	1.07	375	810	1.45	1175	210	2.19	460	299
78	2300	1.22	2800	460	1.74	800	350	1.07	375	810	1.45	1175	210	2.19	460	299
79	2400	1.11	2663	460	1.65	760	320	0.99	318	780	1.38	1078	206	2.13	438	285
80	2200	1.25	2750	477	1.67	797	306	1.05	321	783	1.43	1118	212	2.18	462	300
81	2300	1.24	2850	470	1.70	798	320	1.03	330	790	1.43	1128	230	2.07	475	309
82	2250	1.27	2860	469	1.71	800	320	1.03	329	789	1.43	1129	231	2.07	478	311
83	2200	1.33	2927	460	1.75	806	350	0.96	336	810	1.41	1142	232	2.07	480	312
84	2150	1.33	2860	465	1.72	798	350	0.95	332	815	1.39	1130.0	230	2.09	480	312
85	2100	1.36	2850	465	1.72	799	350	0.95	333	815	1.39	1132	230	2.09	480	312
86	2050	1.32	2700	450	1.82	820	320	1.00	320	770	1.48	1140	225	2.05	462	300
87	2000	1.37	2750	450	1.78	800	325	1.00	325	775	1.45	1125	230	2.07	477	310
88	2100	1.33	2800	450	1.78	800	320	1.00	320	770	1.45	1120	230	2.07	477	310

[a] Area - 1000 Hectares, Yield - metric tons per hectare, Prod - total production.
Source: World Outlook Board, USDA, personal communication.

cultivated. Vegetable production reached 900,000 tons in 1978 from a cultivated area of 114,000 hectares. Potatoes constituted 40 percent of the country's vegetable output. Oilseed production was concentrated in linseed and sesame. It amounted to 62,000 tons in 1976 from an area of 106,000 hectares.

Livestock

The livestock industry in Afghanistan was also important. The national flock of ordinary sheep, Karakul sheep, and goats was an estimated 25 million in 1978, with pastoralists and nomads moving between the winter grazing in the plains and the high mountain pastures in the Hindu Kush. Cattle, estimated at 3.6 million, were mainly used for draught, milk and meat. Generally, each farm family had the use of one pair of draught oxen; thus, the number of pairs of oxen in use in 1978 can be estimated at 1.2 million. Camels, horses and donkeys, in all about 2 million, were the main means of transport in the difficult terrain. Livestock were also a vital buffer against poor harvests when they were sold to buy grain.

TABLE 4

Wheat Statistics for Afghanistan, Pakistan, and Iran[a]

Year	Iran			Afghanistan			Pakistan		
	Area K HA	Yield KG/HA	Total Prod	Area K HA	Yield KG/HA	Total Prod	Area K HA	Yield KG/HA	Total Prod
1961-65	3580	802	2873	2321	951	2207	4984	833	4153
1969-71	5340	735	3946	2199	978	2150	6122	1110	6796
1974		904	4700	2278	1207	2750	6113	1248	7629
1975		979	5483	2350	1191	2800	5812	1320	7673
1976		1154	6000		1229	2950	6111	1413	8636
1978		1018	5700	2348	1198	2813	6360	1316	8367
1979		1055					6687	1488	9950
1980		1091	6000				6912	1563	10805
1979-81	5894	1036	6100	2220	1241	2754	6865	1566	10760
1984		948		2321	1228	2850	7343	1482	10882
1985	6209	1073	6661	2313	1189	2750	7259	1612	11703
	6458	1104	7128				7403	1881	13923

[a] K HA - 1000 Hectares, KG/HA - kilograms per hectare, Total prod - total production in thousand metric tons.

Source: FAO Production Yearbooks: 1986, 1980, & 1983.

Fertilizer Use

Chemical fertilizer use in Afghanistan is subsidized by the government and two types of fertilizer are in regular use. Compound fertilizer, colloquially known as grey fertilizer, is used at or before seeding and is mainly diammonium phosphate. Nitrogen fertilizer or urea, colloquially known as white fertilizer, is used at seeding and on the growing crop in the spring. Just prior to 1978, 57 to 76 percent of the farmers were using some form of chemical fertilizer. Since animal manure is used for fuel, little animal manure is used as fertilizer on crops.

Considerable discrepancy exists between available estimates of Afghan fertilizer application rates. Table 5 provides FAO statistics on fertilizer use in Afghanistan, Pakistan, and Iran. The FAO figures indicate that total fertilizer consumption in Afghanistan in 1978 was 54 thousand metric tons. Dividing this figure by the approximately 4 million hectares of cropped land, gives an average utilization rate of 13.5 kg per hectare. This application rate must be compared with that given by farmers in response to questions concerning their fertilizer usage as reported by the Agricultural Survey of Afghanistan which is discussed below, beginning on page 8. In the survey, farmers indicate average application rates on the order of 165 to 193 kg per hectare, assuming a bag of fertilizer in Afghanistan weighs 50 kilograms (see Table 6).

Agricultural Credit

Agricultural credit prior to 1978 was based on a traditional system. Wealthy countrymen or nomad creditors lent money under a system known as gerau. A landowner could obtain a loan up to the full value of his land. He was then obligated to turn over half his crop to the lender every year until the debt was repaid in cash. Because the borrower needed most of his remaining harvest for his family, there was rarely much surplus left for sale, and loans took years to pay back. If the borrower died, his family inherited his debt, although they technically still owned the land. The gerau gave the lender, in effect, very high interest rates. The effect was somewhat mitigated, for the borrower usually claimed a very low harvest and the lender seldom got his full share. Still, peasants frequently lost their land de jure to creditors when they proved unable to liquidate the debts.

TABLE 5

Fertilizer Use in Afghanistan, Pakistan, & Iran

Total Fertilizer Consumption (1000 MT)

Year	Afghanistan	Pakistan	Iran
1974	24	403	328
1975	34	426	332
1976	36	554	336
1977	44	631	341
1978	54	717	408
1979	54	880	312
1980	50	987	473
1981	51	1080	613
1982	46	1080	685
1983	53	1244	892
1984	57	1204	1038
1985	50	1253	934

Source: FAO Fertilizer Yearbook, various years.

In an attempt to ameliorate what was seen as an unjust and inefficient situation between the peasants and their debtors, the government, in 1978, cancelled all gerau and other mortgage debts of agricultural laborers, tenants, and small landowners with less than two hectares of land. The cancellation applied only to debts contracted before 1973. The government decided that, given the high interest rates, the lenders had received enough to repay the principal and still have a small profit.

Administrative difficulties with the millions of mortgage and debt agreements caused confusion and delayed the implementation of the program. A viable alternative for agricultural loans was not established. In the new environment, loans were more difficult to obtain, and the effective interest rates on credit rose.

Land Tenure

Knowledge about land tenure in Afghan agriculture is based on a 1967 study. At that time the average size of farm holdings was 3.5 hectares. Over 70 percent of the holdings were smaller than 3.5 hectares. A majority of the farms were owner operated. About a third of the rural dwellers were thought to be landless laborers, sharecroppers, or tenants. The size and nature of farm holdings varied greatly between different regions of the country. The larger average landholding were in the northern and western parts of the country where rain-fed farming predominated. In the central and eastern regions, where there was more irrigable land, holdings were smaller than the national average. This stemmed from the large ratio of people to irrigable land and from inheritance laws that subdivided land into smaller parcels.

The structure of farm ownership was considered an economic problem by analysts in and out of government. The large landholdings were farmed by tenants and sharecroppers who traditionally received a fifth of the harvest. Often the crop was divided evenly if the tenant contributed other inputs, such as seed or fertilizer. Tenants and sharecroppers had reduced incentive to develop the land or use the best inputs. On the other side of the spectrum, a large number of small-scale holdings were often not productive because farmers could not afford the use of modern inputs.

Recent efforts to redistribute land have been largely unsuccessful and may have contributed to the animosity between large portions of the rural population and the government. Apparently, the inadequacy of cadastral information lead the Afghan government to promise more than it could deliver in the way of land reform. The scarcity of cultivable land, and especially irrigable land, made it practically impossible to grant one-hectare plots of first-grade land or its equivalent to every peasant as the government had expected it could do. Instead there was a shortage approaching 350,000 hectares of first-grade land. Later the government realized this deficit was even greater when the nomadic population was considered. The government also found that providing formerly landless peasants with plots of low-yield dryland was of little value without other inputs, which were also unavailable. Although outside observers believed the government had abandoned the land reform program in 1981, the government, in 1985, claimed that between 1978 and 1985 about 688,520 hectares had been redistributed among 319,538 families.

AGRICULTURE IN AFGHANISTAN SINCE 1978

Although official Afghanistan statistics indicate an increase in agricultural output during the 1980s, the most likely consequence of the state of war which existed prior to and during the presence of Soviet troops in Afghanistan was a general reduction in agricultural output. The primary, non-governmental source of information on Afghan agriculture from 1978 to the present is The Agricultural Survey of Afghanistan (ASA), by Dr. Azam Gul et al.

The depopulation of the countryside and activities of war diverted substantial portions of the agricultural labor force from their usual pursuits. As a result, the maintenance of the irrigation system was neglected and farms had to be operated with only one half of the normal human power. The lack of labor forced

farmers to cultivate less land than they had prior to the war. Wheat acreage, in 1982, was estimated by the ASA to be two-thirds of its prewar level. Similar decreases were estimated for the other major crops. In general, agricultural production in 1987 was estimated to be about 53 percent of its level in 1978.

Production declines were also attributed to large price increases and a lack of availability of equipment, seed, draught animals, fertilizer, and gasoline. The number of draught oxen owned by farm families was estimated to have fallen by 40 percent. Wheat seed prices were reported to have risen from Af62.2 per seer in 1978 to Af154 in 1982. (In Afghanistan a seer is equivalent to about 7.08 KG.) The proportion of farmers using urea fertilizer has declined to 53 percent from 76 percent and those using compound fertilizer has declined to 33 percent from 57 percent of the farmers.

Not only was the cultivated area reduced after 1978, but the crop yield per hectare also fell. Nationally, wheat output was estimated, by the ASA, to have been 50 percent lower in 1982 than in 1978. Similarly, rice yields fell by 65 percent, barley 40 percent, corn 63 percent, and cotton 70 percent. Several factors combined to produce this reduced productivity. High-yield seeds were less available, and fertilizer use declined dramatically, according to refugee farmers. The damage to the irrigation system (approximately 40 percent of the traditional irrigation system has been destroyed) caused water supply problems. Finally, there was direct damage to crops from hostilities, including actions against growing and stored crops. The resultant combination of smaller cultivated acreage and lower yields must have drastically lowered farm production. Table 6 shows some selected production and input use figures reported by the ASA.

TABLE 6

Selected Yield and Input-use Statistics

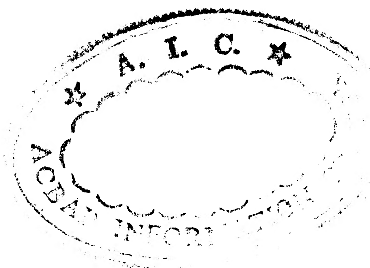
Year	Wheat Yield Dry (mt/ha)	Wheat Yield Irrig. (mt/ha)	Fertilizer Use White (kg/ha)	Fertilizer Use Grey (kg/ha)	Labor Use Family No.	Labor Use Hired % Using	Labor Use Hired No.	Land Prep. % Using Ox	Land Prep. % Using Tractor
1978	1.1	2.4	193	165	1.9	32	1.4	92	8
1980	1.0	2.2	183	158	1.8	29	1.3	91	9
1985	0.7	1.8	178	145	1.6	26	1.1	83	17
1986	0.5	1.7	168	143	1.6	25	1.1	79	22
1987	0.8	1.8	173	145	1.5	21	1.1	78	23

Source: The Agricultural Survey of Afghanistan

The ASA concluded that present agricultural production in agriculture is insufficient to support the existing Afghan population without the additional demands of the returning refugees. Afghan farmers will need assistance to reestablish agricultural production to its pre-1978 levels. The most obvious needs are for supplementary food and agricultural inputs during the reestablishment process. The production of some of the most important inputs will require time and therefore implies that the reestablishment process cannot be accomplished within a short period of time such as two to three years.

STAFF WORKING PAPER SERIES

No. 1



AGRICULTURE IN AFGHANISTAN:

A BACKGROUND PAPER FOCUSING ON WHEAT



KANSAS STATE UNIVERSITY

FOOD & FEED GRAIN INSTITUTE
MANHATTAN, KANSAS 66506